

**Level I Scoping Ecological Risk Assessment
Swan Island Upland Facility
Operable Unit 1
Portland, Oregon**

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LIST OF ACRONYMS AND ABBREVIATIONS

<u>Acronym</u>	<u>Description</u>
ACA	Ash Creek Associates
BWTP	Ballast Water Treatment Plant
CGSRY	Cascade General Ship Repair Yard
COIs	Contaminants of Interest
ECSI	Environmental Cleanup Site Information
ERA	Ecological Risk Assessment
ft bgs	Feet Below Ground Surface
FS	Feasibility Study
GIS	Geographic Information System
IH	Heavy Industrial
JSCS	Joint Source Control Strategy
LWG	Lower Willamette Group
NF	NewFields
NRI	Natural Resource Inventory
OAR	Oregon Administrative Rule
DEQ	Oregon Department of Environmental Quality
OHWL	Ordinary High Water Line
ONHIC	Oregon Natural Heritage Information Center
OU	Operable Unit
PAHs	Polynuclear Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
Port	Port of Portland
PSY	Portland Shipyard
RI	Remedial Investigation
SIUF	Swan Island Upland Facility
T/E	Threatened and Endangered
TMDP	Technical-Management Decision Point
TPHs	Total Petroleum Hydrocarbons
USEPA	U.S. Environmental Protection Agency
VOCs	Volatile Organic Compounds

1.0 INTRODUCTION

Investigation activities are being conducted at the Swan Island Upland Facility (SIUF) under a *Voluntary Agreement for Remedial Investigation, Source Control Measures, and Feasibility Study* (DEQ No. WPMVC-LQVC-NWR-06-07), effective July 24, 2006 (hereafter referred to as Voluntary Agreement). This agreement is between the Port of Portland (Port) and the Oregon Department of Environmental Quality (DEQ). The SIUF was previously identified by the DEQ as Environmental Cleanup Site Information (ECSI) site 271, Portland Shipyard (PSY). For purposes of investigations, the SIUF has been divided into three operable units (OUs), and OU1 is the upland property owned by Cascade General, referred to as the Cascade General Ship Repair Yard (CGSRY).

The Level I Scoping Ecological Risk Assessment (ERA) for OU1 of the SIUF presented in this document was based upon the process prescribed by the DEQ in the *Guidance for Ecological Risk Assessment: Levels I, II, III, IV* (DEQ, 1998 with updates through 2001). The guidance describes a sequence for conducting ERAs, beginning with Level I Scoping. The purpose of the Level I Scoping ERA is to provide a conservative qualitative determination of whether there is reason to believe that ecological receptors and/or exposure pathways are present at OU1. If existing information indicates that site conditions will not result in exposure to ecological receptors, then no further risk analysis is necessary. If hazardous substances and exposure pathways are present, the process proceeds to a Level II screening analysis to determine if hazardous substances are present at potentially ecotoxic concentrations and, if so, what additional risk analysis may be necessary to make risk management decisions for a facility.

DEQ guidance for the Level I ERA deliverable was used as the basis for organizing this ERA. Section 1 presents the location, history, current uses, and ecological features of OU1 relevant to the Scoping ERA. Additional detailed information is presented in the *Phase II Remedial Investigation Work Plan Addendum for Operable Unit 1* (Bridgewater Group 2007a). Section 2 summarizes the constituents of interest (COIs) and Section 3 details the relevant exposure pathways for OU1. Section 4 provides the recommendations of the Level I scoping process. The Level I deliverable also includes a checklist for summarizing OU1 features based on a site visit, and a form for evaluating potential receptor-pathway interactions. These forms are included as Attachments 2 and 3 to this ERA.

1.1 Site Location

OU1 is an upland facility located on Swan Island off the east bank of the Willamette River between River Miles 8 and 9.2, Portland, Oregon (Figure 1). Figure 1 shows the location of the SIUF, the boundary of OU1, and aerial photography of the area. According to the Voluntary

Agreement, SIUF is comprised of 94 acres, and OU1 includes the approximately 57 acres of uplands in the northwestern portion of Swan Island.

In accordance with the Voluntary Agreement, the scope of the Level I ERA at OU1 is limited to the upland areas above the ordinary high water line (OHWL) of the Willamette River. The scope of the ERA does not include adjacent sediments, submerged lands, and submersible lands of the river or the Swan Island Lagoon, certain facilities currently owned and operated by Cascade General (e.g., dry docks, storm water conveyance systems), nor other adjacent upland sites. For details about the scope of the investigations, refer to the Voluntary Agreement.

1.2 Site History

Swan Island was originally a periodically flooded sand bar and marsh with the main channel of the Willamette River located between the island and Mocks Bottom to the east. The Willamette River on the west side of the island was too shallow for ship navigation. In 1923, the main channel of the Willamette River was relocated from the east to the west side of the island. A causeway was built in the east channel from the mainland to the island, and the south end of Mocks Bottom was raised, making a peninsula of the island and creating a still-water lagoon of the east channel. Additional geological and hydrogeological information is provided in Bridgewater Group (2007a).

Prior to the early 1940s, OU1 was part of the Portland Municipal Airport. Since then, the area has been used for industrial purposes, principally ship construction and repair. Between 1942 and 1949, the US Maritime Commission and the War Assets Administration authorized Kaiser Shipbuilding and Consolidated Builders to perform ship-building, ship repair and ship-breaking on OU1. Between 1950 and 1995, the Port owned and managed the PSY. Ship repair activities were conducted during this time period. The Port also leased certain buildings and facilities to various tenants. In 1995, Cascade General took over the PSY and in 2000 purchased PSY, including OU1, from the Port. Additional site history is presented in the *Draft Supplemental Preliminary Assessment, Swan Island Upland Facility*, submitted to DEQ on December 18, 2006 (Ash Creek Associates/NewFields [ACA/NF] 2006).

1.3 Current Site Use

OU1 is the upland property owned by Cascade General. Cascade General currently performs ship repair and maintenance, and constructs barges at OU1. Cascade General also leases space to tenants that perform metal fabrication and other industrial activities. According to City of Portland quarter-section zoning maps (Chapter 33.140 of Title 33, the Planning and Zoning Code), SIUF is designated for heavy industrial (IH) use. The zoning for OU1 includes a Greenway overlay zone of "i", which is the River Industrial Overlay Zone. The River Industrial Overlay Zone encourages and promotes the development of river-dependent and river-related

industries which strengthen the economic viability of Portland as a marine shipping and industrial harbor, while preserving and enhancing the riparian habitat and providing public access where practical. In addition, under Chapter 33.585 of Title 33, the Swan Island Plan District was established to foster the continuation and growth of the PSY (now referred to as the CGSRY), a unique waterfront basic industry. No change in future land use is anticipated (Bridgewater Group 2007a).

OU1 is surrounded by similarly developed, industrial tracts. Other properties on Swan Island and across Swan Island Lagoon are zoned General Industrial 2 (IG2). The SIUF is bounded to the southwest and northwest by the Willamette River and Swan Island Lagoon.

1.4 Ecological Features and Sensitive Environments

An overall description of the location, physical features, current uses, and history of SIUF is presented in the *Phase II RI Addendum* for OU1 (Bridgewater Group 2007a). The following sections are intended to supplement that information for elements relevant to the Level I Scoping. The ecological features are described based on facility visits, aerial photographs, and general Facility knowledge. Attachment 1 contains photos of the facility taken during a site visit in January 2008. Refer to Attachment 2 (Level I Ecological Scoping Checklist) and Attachment 3 (Level I Evaluation of Receptor-Pathway Evaluations), as required by DEQ (2001).

The Willamette River and Swan Island Lagoon surround SIUF on three sides. Over 97 percent of OU1 is comprised of developed areas including asphalt-covered parking lots, or gravel-covered work areas, concrete slabs, or buildings (Figure 1). Any existing vegetation on this part of the disturbed upland area is ruderal, consisting of opportunistic or weedy annual species growing along the margins of roads or buildings, landscaped grass areas, or a few planted trees along roads and near buildings. The surface soil conditions and use of OU1 prevent the development of contiguous, extensive habitat.

All of the riverbank area of SIUF has been modified by dredge/fill operations conducted to construct Swan Island and the construction of marine facilities. The riverbank at OU1 is mostly composed of piers, berths, bulkheads, and other structures or riprap (Figure 1). The only areas of contiguous vegetation occur on the riverbank along the Ballast Water Treatment Plant (BWTP), and include a narrow (3-5 m) strip of shrubs (dominated by Himalayan blackberry and scotch broom). This strip of shrubs is situated between a strip of riprap armoring that spans the water line at all but the highest river stages, and a landscaped grass area that extends up the slope to the working area of the OU1 surface (See photographs 9, 10, 11, Attachment 1).

The depth to groundwater in OU1 ranges from 18 to 30 feet below ground surface (ft bgs), and there are no wetlands or permanent surface water bodies on OU1.

Industrial development in the vicinity significantly limits the habitat potential of this facility. OU1 is surrounded by industrial tracts and no significant upland ecological resources are present within 1 mile of OU1. The upland area will continue to be used for industrial purposes. The areas with small amounts of vegetation have limited habitat value because they are small, surrounded by paved areas or structures, distant from any other vegetated areas, and there are significant barriers and lack of any corridor to provide wildlife cover during travel. Any wildlife use would be intermittent. OU1 does not currently and will not provide suitable habitat for ecological receptors because of former, current, and reasonably likely future uses of the property.

The Willamette River near the OU1 upland facility provides habitat for aquatic and semi-aquatic species. The river is identified as a sensitive environment in OAR 340-122-0115. As discussed in detail in Section 4.0, the beach area and river adjacent to OU1 are being evaluated as part of the Portland Harbor Superfund Site Remedial Investigation/Feasibility Study (RI/FS) ERA and a separate Joint Source Control Strategy (JSCS) evaluation.

1.5 Threatened and Endangered Species

A listing of threatened and endangered (T/E) species potentially present in the area was provided by the Oregon Natural Heritage Information Center (ONHIC). The list includes historical presence of federal and state-listed species. Attachment 4 to this ERA summarizes the species listed by the ONHIC.

According to ONHIC information, areas within 2 miles of SIUF potentially contain habitat for several terrestrial or semi-terrestrial species of interest, including one plant species, several bird species, one bat species, and one turtle species. Peregrine falcons are federally listed T/E species that are known to nest in other areas along the Willamette River, but SIUF does not contain habitat suitable for this species. Thus, no T/E species are known to inhabit the SIUF.

Areas within 2 miles of SIUF potentially contain habitat for several fish species of interest, however, OU1 does not provide aquatic habitat in which these fish species would be found. As discussed in detail in Section 4.0, the beach area and river adjacent to OU1 are being evaluated as part of the Portland Harbor Superfund Site RI/FS ERA and a separate Joint Source Control Strategy (JSCS) evaluation.

2.0 CONSTITUENTS OF INTEREST (COIs)

In accordance with the Voluntary Agreement, the potential hazardous substances (i.e., COIs) in soil and groundwater at OU1 are metals, volatile organic compounds (VOCs), total petroleum hydrocarbons (TPHs), polynuclear aromatic hydrocarbons (PAHs), butyltins, and

polychlorinated biphenyls (PCBs). Sampling of surface and subsurface soils and groundwater was conducted at OU1 prior to the sale of the Portland Shipyard to Cascade General, and during the Phase IA, IB, and II Portland Shipyard Remedial Investigations. For purposes of the investigation, OU1 was divided into two areas: 1). BWTP and Building 72 Area and 2). Main Shipyard Area. A summary of the sampling events and the analytical results are presented in Bridgewater Group (2007a).

2.1 COIs in Soil

Metals, PCBs, TPHs, and PAHs were detected in surface and subsurface soils within the BWTP and Building 72 area (Bridgewater Group 2007a). Elsewhere on OU1, metals, PCBs, TPHs, PAHs, and VOCs were detected in surface and subsurface soils (Bridgewater Group 2007a).

Initial screening of the analytical results did not lead to the identification of soil hotspot locations in either sampling area.

2.2 COIs in Groundwater

Metals, VOCs, and PAHs were detected in groundwater samples within the BWTP and Building 72 area. Elsewhere on OU1, metals, VOCs, and PAHs were detected in groundwater samples.

Based on groundwater samples collected in December 2006, metals, VOCs and PAHs were not detected in OU1 groundwater at concentrations exceeding ecological screening levels (i.e., USEPA ambient water quality criteria or DEQ freshwater Level II ecological screening levels) (Bridgewater Group 2007b).

2.3 Observed Impacts

No ecotoxicological impacts on ecological receptors have been observed at OU1. As indicated above, there are no ecological resources (habitat or food sources) located within the working area of OU1. No receptors other than waterfowl and other birds associated with the river have been observed at OU1.

3.0 EXPOSURE PATHWAYS

A general evaluation of potential exposure pathways is provided in the Level I Scoping checklists in Attachments 2 and 3.

Most of OU1 is covered by buildings, asphalt, pavement, or gravel and does not represent an ecological resource. Onsite soils are paved, covered by structures, fenced, or otherwise inaccessible to contact by ecological receptors. Vegetation is very limited, and where it exists, it consists mostly of introduced or planted species and is surrounded by paved areas and structures. The riverbank areas are mostly occupied by structures or riprap and also do not provide extensive habitat for ecological receptors. Site topography prevents overland soil transport to the riverbanks. As a result, wildlife are unlikely to visit or feed at OU1 and would not be significantly exposed to surface soil contaminants.

As noted above, there are no surface water bodies on OU1. Groundwater is at least 18 feet below ground surface and contaminants have not been detected at concentrations exceeding ecological screening levels. Therefore, exposure of terrestrial receptors to site-specific contaminants on the upland or riverbank areas is unlikely.

In accordance with DEQ policy for the Portland Harbor, risk assessments for upland facilities will not include receptors or pathways in the Willamette River. Potential indirect contact of river-related receptors to groundwater or erodible soils from OU1 is addressed in a separate Joint Source Control Evaluation (JSCS) evaluation, in accordance with DEQ/USEPA (2005), in Bridgewater Group (2007a).

4.0 RECOMMENDATIONS

The goal of the Level I scoping evaluation is to determine whether there is any reason to believe that ecological receptors and/or exposure pathways are present or potentially present at the Facility. Scoping is intended to identify sites that are obviously devoid of ecological important species or habitats and/or where exposure pathways are obviously incomplete (DEQ 2001). The Level I scoping evaluation presented in this document yields the following conclusions: 1) there are no significant ecological resources at OU1; and 2) asphalt, paving, gravel, structures, fences, and riprap prevent extensive contact of plant and animal populations to onsite soils. As a result, there are incomplete or extremely limited exposure pathways for terrestrial plant and animal populations to soil or groundwater at OU1.

According to DEQ guidance (2001), technical management decision points (TMDPs) are steps in the risk assessment process where one of the following three recommendations is determined: 1) no further ecological investigations at the site; 2) continuation of the risk assessment process to the next level; or 3) undertake a removal or remedial action. DEQ guidance identifies a TMDP at the end of the Level I scoping process to determine if ecological risk is suspected. This Level I scoping evaluation concludes that OU1 has limited or no ecological resource value and is highly unlikely to present significant risks to upland ecological receptors, and further ecological evaluations of OU1 are deemed unnecessary.

There are no known pathways for the transport of hazardous substances in groundwater or erosional movement of soils impacted by hazardous substances in OU1 to the river. However, in accordance with DEQ policy, this evaluation excludes explicit evaluation of pathways or exposure to aquatic receptors in the Willamette River. The beach area and river adjacent to OU1 are being evaluated as part of the Portland Harbor RI/FS ERA. In addition, potential exposure to river-related receptors from indirect exposure to soil and groundwater is evaluated as part of a separate JSCS evaluation presented in Bridgewater Group (2007a).

5.0 REFERENCES

- Ash Creek Associates/NewFields (ACA/NF). 2006. Draft Supplemental Preliminary Assessment, Swan Island Upland Facility, Portland, Oregon. Prepared for the Port of Portland.
- Bridgewater Group, Inc. 2007a. Phase II Remedial Investigation Work Plan Addendum for Operable Unit 1, Swan Island Upland Facility, Portland, Oregon. Prepared for the Port of Portland.
- Bridgewater Group, Inc. 2007b. 2006 Annual Groundwater Monitoring Results, Swan Island Upland Facility, Portland, Oregon. Prepared for the Port of Portland.
- Oregon Department of Environmental Quality (DEQ). 2001. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management & Cleanup Division, Final April 1998, updated May 2001.
- Oregon Department of Environmental Quality (DEQ) and U.S. Environmental Protection Agency (USEPA). 2005. Portland Harbor Joint Source Control Strategy, Final, December 21, 2005. Updates at [http://www.deq.state.or.us/nwr/Portland Harbor/jscs](http://www.deq.state.or.us/nwr/Portland%20Harbor/jscs).

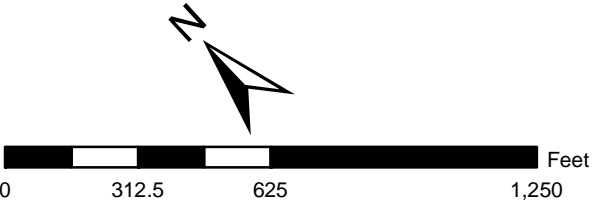
FIGURES



Legend

 OU1 Boundary

*Boundary partially based on Ordinary High Water Line (OHWL)-
at 16.6 feet above mean sea level, National Geodetic Vertical Datum of 1929*



SWAN ISLAND UPLAND FACILITY
PORT OF PORTLAND, OREGON

FIGURE 1
LOCATION OF
OPERABLE UNIT 1

PRJ: 0219-018-900	DATE: DEC 28, 2007
REV: 0	BY: RCR CHK: MCL



ATTACHMENT 1

**Site Photos (January 2008)
For Operable Unit 1, Swan Island Upland Facility**



Photo 1. Center of SIUF near Paint Sheds and Bays 6, 7, 8, and 9.



Photo 2. Center of SIUF near Paint Sheds and Bays 6, 7, 8, and 9.



Photo 3. Center of SIUF, near the Main Gate.

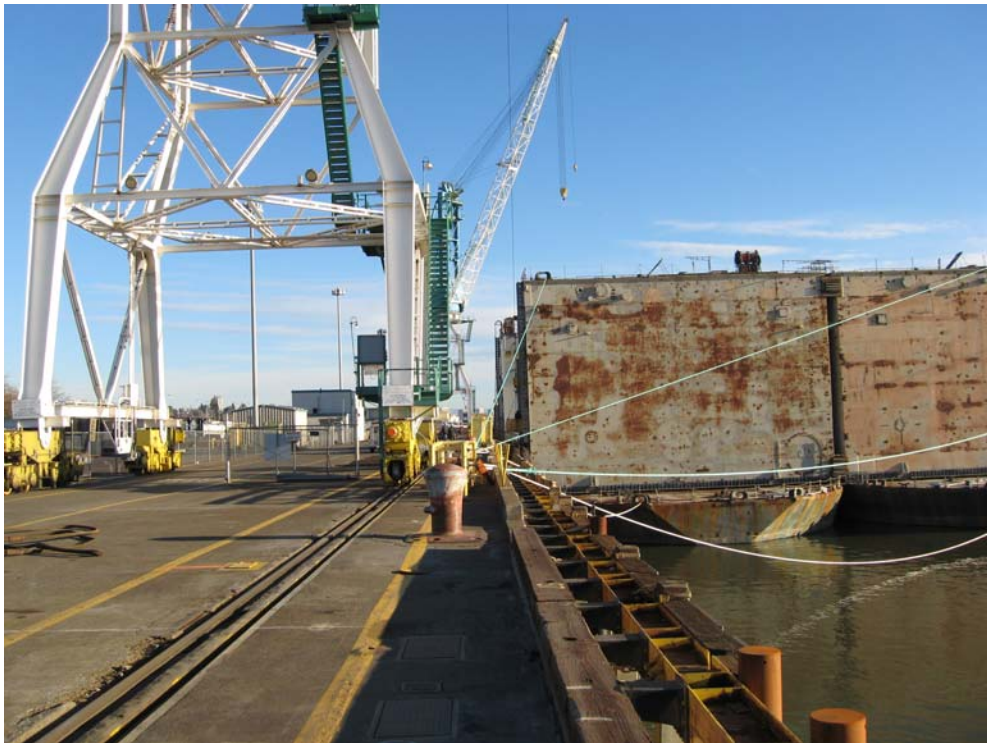


Photo 4. Near Berth 314 along the Main Channel of the Willamette River.

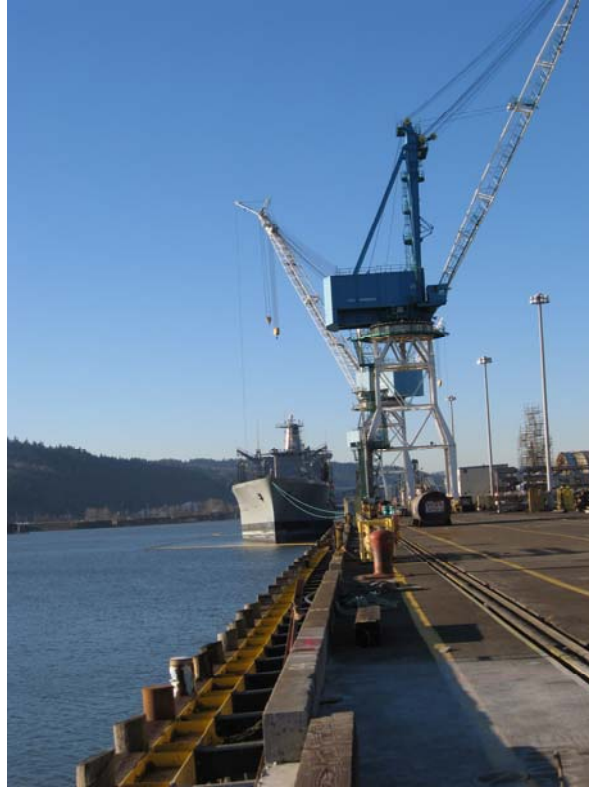


Photo 5. SIUF OU 1 Boundary along the Main Channel of the Willamette River between Berths 312 and 313.



Photo 6. SIUF OU1 Boundary between Dry Dock #4 and Main Island Area.



Photo 7. SIUF OU1 Boundary between Berths 312 and 313 along the Main Channel of the Willamette River.



Photo 8. SIUF OU1 Boundary between Dry Dock #4 and Main Island Area.



Photo 9. Landscaped Grass Area along Shoreline of Willamette River near the Ballast Water Treatment Plant.



Photo 10. Landscaped Grass Area and Ruderal Vegetation along Western Shoreline near Ballast Water Treatment Plant.



Photo 11. Ruderal Vegetation and riprap along Shoreline near Ballast Water Treatment Plant.



Photo 12. Landscaped Grass Area above Shrubs along Shoreline just Northeast of the Ballast Water Treatment Plant.



Photo 13. Shoreline just North of Ballast Water Treatment Plant.



Photo 14. SIUF OU1 Boundary between Ballast Water Treatment Plant and Dry Dock #3.



Photo 15. Inland Area between Ballast Water Treatment Plant and Dry Dock #3.



Photo 16. Shoreline between Berths 305 and 306 Adjacent to Steelhead.



Photo 17. Ruderal Vegetation along Shoreline between Berths 305 and 306 Adjacent to Steelhead.

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GUIDANCE FOR ECOLOGICAL RISK ASSESSMENT
LEVEL I – SCOPING

ATTACHMENT 2

Ecological Scoping Checklist
for Operable Unit 1, Swan Island Upland Facility

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GUIDANCE FOR ECOLOGICAL RISK ASSESSMENT
LEVEL I – SCOPING

ATTACHMENT 2
Ecological Scoping Checklist

Site Name	Swan Island Upland Facility (OU1)
Date of Site Visit	January 2008
Site Location	Swan Island, Portland, OR, 97217
Site Visit Conducted by	Mark Lewis, NewFields Boulder

Part 1

CONTAMINANTS OF INTEREST Types, Classes, Or Specific Hazardous Substances ‡ Known Or Suspected	Onsite	Adjacent to or in locality of the facility †
Total petroleum hydrocarbons (TPH)	X	
Polynuclear aromatic hydrocarbons (PAHs)	X	
Polychlorinated biphenyls (PCBs)	X	
Volatile organic compounds (VOCs)	X	
Metals	X	

‡ As defined by OAR 340-122-115(30) † As defined by OAR 340-122-115(34)

Part 2

OBSERVED IMPACTS ASSOCIATED WITH THE SITE	Finding
Onsite vegetation (None, Limited, Extensive)	None (no effects attributable to chemical toxicity)
Vegetation in the locality of the site (None, Limited, Extensive)	Limited
Onsite wildlife such as macroinvertebrates, reptiles, amphibians, birds, mammals, other (None, Limited, Extensive)	Limited
Wildlife such as macroinvertebrates, reptiles, amphibians, birds, mammals, other in the locality of the site (None, Limited, Extensive)	Limited
Other readily observable impacts (None, Discuss below)	None
Discussion: Over 97% of the land cover at OU1 is comprised of buildings, structures, paved surfaces, gravel, riprap, etc. Industrial development in the vicinity significantly limits the habitat potential of this facility. Vegetation is characterized as extremely limited, confined to narrow marginal strips and predominately comprised of ruderal species. Wildlife observed onsite was limited to approximately 5 Canada geese. Offsite wildlife in the vicinity was limited to double-breasted cormorants and gulls resting on floating objects in the river offshore of the site.	

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GUIDANCE FOR ECOLOGICAL RISK ASSESSMENT
LEVEL I – SCOPING

ATTACHMENT 2
Ecological Scoping Checklist (cont'd)

Part 3

SPECIFIC EVALUATION OF ECOLOGICAL RECEPTORS / HABITAT	Finding
<i>Terrestrial - Wooded</i>	
Percentage of site that is wooded *NOTE: this habitat is only found as planted landscape trees	<1%
Dominant vegetation type (Evergreen, Deciduous, Mixed)	D
Prominent tree size at breast height, i.e., four feet (<6", 6" to 12", >12")	> 12"
Evidence / observation of wildlife (Macroinvertebrates, Reptiles, Amphibians, Birds, Mammals, Other)	None observed
<i>Terrestrial - Scrub/Shrub/Grasses</i>	
Percentage of site that is scrub/shrub. *NOTE: this habitat is only found in two small riverbank areas	~2%
Dominant vegetation type (Scrub, Shrub, Grasses, Other)	Sc
Prominent height of vegetation (<2', 2' to 5', >5')	2'-5' on riverbank
Density of vegetation (Dense, Patchy, Sparse)	S or absent on upland; D on riverbank
Evidence / observation of wildlife (Macroinvertebrates, Reptiles, Amphibians, Birds, Mammals, Other)	None observed
<i>Terrestrial - Ruderal</i>	
Percentage of site that is ruderal *NOTE: the majority of the site (at least 97%) is developed/paved, with sparse ruderal, weedy vegetation at road edges	97%
Dominant vegetation type (Landscaped, Agriculture, Bare ground)	B (paved, gravel, riprap, structures)
Prominent height of vegetation (0', >0' to <2', 2' to 5', >5')	>0' to <2'
Density of vegetation (Dense, Patchy, Sparse)	S on upland
Evidence / observation of wildlife (Macroinvertebrates, Reptiles, Amphibians, Birds, Mammals, Other)	None observed
<i>Aquatic - Non-flowing (lentic)</i>	
Percentage of site that is covered by lakes or ponds	0%
Type of water bodies (Lakes, Ponds, Vernal pools, Impoundments, Lagoon, Reservoir, Canal)	N/A
Size (acres), average depth (feet), trophic status of water bodies	N/A
Source water (River, Stream, Groundwater, Industrial discharge, Surface water runoff)	N/A
Water discharge point (None, River, Stream, Groundwater, Wetlands impoundment)	N/A
Nature of bottom (Muddy, Rocky, Sand, Concrete, Other)	N/A
Vegetation present (Submerged, Emergent, Floating)	N/A
Obvious wetlands present (Yes / No)	N/A
Evidence / observation of wildlife (Macroinvertebrates, Reptiles, Amphibians, Birds, Mammals, Other)	N/A
<i>Aquatic - Flowing (lotic)</i>	
Percentage of site that is covered by rivers, streams (brooks, creeks), intermittent streams, dry wash, arroyo, ditches, or channel waterway. *NOTE: No permanent waterbody other than Willamette River, which is adjacent to Operable Unit 1.	0%

Oregon Department of Environmental Quality
GUIDANCE FOR ECOLOGICAL RISK ASSESSMENT
LEVEL I – SCOPING

ATTACHMENT 2
Ecological Scoping Checklist (cont'd)

Type of water bodies (Rivers, Streams, Intermittent Streams, Dry wash, Arroyo, Ditches, Channel waterway)	N/A
Size (acres), average depth (feet), approximate flow rate (cfs) of water bodies	N/A
Bank environment (cover: Vegetated, Bare / slope: Steep, Gradual / height (in feet))	N/A
Source water (River, Stream, Groundwater, Industrial discharge, Surface water runoff)	N/A
Tidal influence (Yes / No)	N/A
Water discharge point (None, River, Stream, Groundwater, Wetlands impoundment)	N/A
Nature of bottom (Muddy, Rocky, Sand, Concrete, Other)	N/A
Vegetation present (Submerged, Emergent, Floating)	N/A
Obvious wetlands present (Yes / No)	N/A
Evidence / observation of wildlife (Macroinvertebrates, Reptiles, Amphibians, Birds, Mammals, Other)	N/A
Aquatic - Wetlands	
Obvious or designated wetlands present (Yes / No)	No
Wetlands suspected as site is/has (Adjacent to water body, in Floodplain, Standing water, Dark wet soils, Mud cracks, Debris line, Water marks)	N/A
Vegetation present (Submerged, Emergent, Scrub/shrub, Wooded)	N/A
Size (acres) and depth (feet) of suspected wetlands	N/A
Source water (River, Stream, Groundwater, Industrial discharge, Surface water runoff)	N/A
Water discharge point (None, River, Stream, Groundwater, Impoundment)	N/A
Tidal influence (Yes / No)	N/A
Evidence / observation of wildlife (Macroinvertebrates, Reptiles, Amphibians, Birds, Mammals, Other)	N/A

* **P:** Photographic documentation of these features is highly recommended.

ECOLOGICALLY IMPORTANT SPECIES / HABITATS OBSERVED
Industrial development in the site vicinity significantly limits the habitat potential of this facility. The upland area will continue to be used for industrial purposes. No ecologically important habitats are observed at OU1. Over 97% of the land cover at OU1 is comprised of buildings, structures, paved surfaces, gravel, riprap, etc. Vegetation is characterized as extremely limited. There is a very small amount of sparse ruderal vegetation along roads, and a few planted trees. There are a few small, narrow riverbank areas where Himalayan blackberry and other weedy vegetation is growing through the riprap. The areas with small amounts of vegetation have limited habitat value because they are small, surrounded by paved areas or structures, distant from any other vegetated areas, and there are significant barriers and lack of any corridor to provide wildlife cover during travel. Any wildlife use would be intermittent. OU1 does not and will not provide suitable habitat for ecological receptors because of former, current, and likely future uses of the property.

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GUIDANCE FOR ECOLOGICAL RISK ASSESSMENT
LEVEL I – SCOPING

ATTACHMENT 3

**Evaluation of Receptor-Pathway Interactions
for Operable Unit 1, Swan Island Upland Facility**

Oregon Department of Environmental Quality
GUIDANCE FOR ECOLOGICAL RISK ASSESSMENT
LEVEL I – SCOPING

ATTACHMENT 3
Evaluation of Receptor-Pathway Interactions

EVALUATION OF RECEPTOR-PATHWAY INTERACTIONS	Y	N	U
Are hazardous substances present or potentially present in surface waters? AND Are ecologically important species or habitats present? AND Could hazardous substances reach these receptors via surface water?		X	
When answering the above questions, consider the following: <ul style="list-style-type: none"> • Known or suspected presence of hazardous substances in surface waters. • Ability of hazardous substances to migrate to surface waters. • Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters. Aquatic receptors may be exposed through osmotic exchange, respiration or ventilation of surface waters. • Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters. • Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source. 	There are no ecologically important species or habitats present. There is no on-site surface water. *		
Notes: In accordance with ODEQ policy for the Portland Harbor, risk assessments for upland facilities will not include receptors or pathways in the Willamette River. There are no onsite surface water bodies or aquatic habitat, and consequently, no exposure to surface water.			
Are hazardous substances present or potentially present in groundwater? AND Are ecologically important species or habitats present? AND Could hazardous substances reach these receptors via groundwater?		X	
When answering the above questions, consider the following: <ul style="list-style-type: none"> • Known or suspected presence of hazardous substances in groundwater. • Ability of hazardous substances to migrate to groundwater. • Potential for hazardous substances to migrate via groundwater and discharge into habitats and/or surface waters. • Contaminants may be taken-up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (1m depth). • Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface. 	There are no ecologically important species or habitats present. *		

Notes: * There is no exposure to terrestrial/upland receptors. Surface water/ groundwater could be transported to the Willamette River; any potential exposure to in-water receptors is being evaluated separately. Groundwater is at least 18 feet below ground surface and contaminants have not been detected at concentrations exceeding ecological screening levels. As a result, exposure of terrestrial receptors to site-specific contaminants on the upland or riverbank areas is unlikely.

“Y” = yes; “N” = No, “U” = Unknown (counts as a “Y”)

Oregon Department of Environmental Quality
GUIDANCE FOR ECOLOGICAL RISK ASSESSMENT
LEVEL I – SCOPING

ATTACHMENT 3
Evaluation of Receptor-Pathway Interactions (cont'd)

EVALUATION OF RECEPTOR-PATHWAY INTERACTIONS	Y	N	U
Are hazardous substances present or potentially present in sediments? AND Are ecologically important species or habitats present? AND Could hazardous substances reach these receptors via contact with sediments?		X	
When answering the above questions, consider the following: <ul style="list-style-type: none"> • Known or suspected presence of hazardous substances in sediment. • Ability of hazardous substances to leach or erode from surface soils and be carried into sediment via surface runoff. • Potential for contaminated groundwater to upwell through, and deposit contaminants in, sediments. • If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods. Aquatic receptors may be directly exposed to sediments or may be exposed through osmotic exchange, respiration or ventilation of sediment pore waters. • Terrestrial plants may be exposed to sediment in an area that is only periodically inundated with water. • If sediments are present in an area that is only periodically inundated with water, terrestrial species may have direct access to sediments for the purposes of incidental ingestion. Aquatic receptors may regularly or incidentally ingest sediment while foraging. 	There are no ecologically important species or habitats present. There are no on-site sediments.		
Notes: In accordance with ODEQ policy for the Portland Harbor, risk assessments for upland facilities will not include receptors or pathways in the Willamette River. There are no onsite surface water bodies, and subsequently no sediments to which ecological receptors would be exposed.			
Are hazardous substances present or potentially present in prey or food items of ecologically important receptors? AND Are ecologically important species or habitats present? AND Could hazardous substances reach these receptors via consumption of food items?		X	
When answering the above questions, consider the following: <ul style="list-style-type: none"> • Higher trophic level terrestrial and aquatic consumers and predators may be exposed through consumption of contaminated food sources. • In general, organic contaminants with log Kow > 3.5 may accumulate in terrestrial mammals and those with a log Kow > 5 may accumulate in aquatic vertebrates. 	There are no ecologically important species or habitats present.		

“Y” = yes; “N” = No, “U” = Unknown (counts as a “Y”)

Oregon Department of Environmental Quality
GUIDANCE FOR ECOLOGICAL RISK ASSESSMENT
LEVEL I – SCOPING

ATTACHMENT 3
Evaluation of Receptor-Pathway Interactions (cont'd)

EVALUATION OF RECEPTOR-PATHWAY INTERACTIONS	Y	N	U
Are hazardous substances present or potentially present in surficial soils? AND Are ecologically important species or habitats present? AND Could hazardous substances reach these receptors via incidental ingestion of or dermal contact with surficial soils?		X	
When answering the above questions, consider the following: <ul style="list-style-type: none"> • Known or suspected presence of hazardous substances in surficial (1m depth) soils. • Ability of hazardous substances to migrate to surficial soils. • Significant exposure via dermal contact would generally be limited to organic contaminants which are lipophilic and can cross epidermal barriers. • Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash). • Contaminants in bulk soil may partition into soil solution, making them available to roots. Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil. 	There are no ecologically important species or habitats present. Soils are largely covered by paved surfaces and gravel.		
Are hazardous substances present or potentially present in soils? AND Are ecologically important species or habitats present? AND Could hazardous substances reach these receptors via vapors or fugitive dust carried in surface air or confined in burrows?		X	
When answering the above questions, consider the following: <ul style="list-style-type: none"> • Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant > 10⁻⁵ atm-m³/mol and molecular weight < 200 g/mol). • Exposure via inhalation is most important to organisms that burrow in contaminated soils, given the limited amounts of air present to dilute vapors and an absence of air movement to disperse gases. • Exposure via inhalation of fugitive dust is particularly applicable to ground-dwelling species that could be exposed to dust disturbed by their foraging or burrowing activities or by wind movement. • Foliar uptake of organic vapors would be limited to those contaminants with relatively high vapor pressures. • Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces. 	There are no ecologically important species or habitats present. Soils are largely covered by paved surfaces and gravel.		

“Y” = yes; “N” = No, “U” = Unknown (counts as a “Y”)

ATTACHMENT 4

**Oregon Natural Heritage Information Center
Species of Special Interest
for Operable Unit 1, Swan Island Upland Facility**

Attachment 4

Oregon Natural Heritage Information Center Species of Special Interest for Operable Unit 1, Swan Island Upland Facility

Common Name	Scientific Name	Federal Status	State Status
Plants			
Tall bugbane	<i>Cimicifuga elata</i>	-	C
Fish¹			
Green sturgeon	<i>Acipenser medirostris</i>	SOC	-
Steelhead (Lower Columbia River ESU, winter run)	<i>Oncorhynchus mykiss</i> pop. 27	LT	SC
Chinook salmon (Lower Columbia River ESU, spring run)	<i>Oncorhynchus tshawytscha</i> pop. 21	LT	SC
Chinook salmon (Lower Columbia River ESU, fall run)	<i>Oncorhynchus tshawytscha</i> pop. 22	LT	SC
Coho salmon (Lower Columbia River/SW Washington Coast ESU)	<i>Oncorhynchus kisutch</i> pop. 1	PT	LE
Birds			
American peregrine falcon	<i>Falco peregrinus annatum</i>	-	LE
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	C	SC
Tricolored blackbird	<i>Agelaius tricolor</i>	SOC	SP
Reptiles/Amphibians			
Painted turtle	<i>Chrysemys picta belli</i>	-	SC
Mammals			
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	SOC	SC

Notes:

¹The Upland Facility does not contain aquatic habitats. Fish are included only because of potentially complete pathways to the Willamette River.

Source: Confidential analysis of rare, threatened and endangered species provided by Oregon Natural Heritage Information Center.

LE - listed endangered

E - endangered

SC or C - sensitive, critical

SP - sensitive-peripheral

SOC - species of concern

LT - listed threatened